International Journal of Clinical Cardiology

Comparison of Clinical Presentation Related on Risk Factors in Older and Younger Patients with Acute Coronary Syndrome

Hossein Asgar Pour[1]*, Reza Norouzzadeh[2] and Mohammad Reza Heidari[3]

[1]Assistant Professor, Department of Surgical Nursing, Aydin School of Health, Adnan Menderes University, Turkey

[2]Lecturer, Faculty of Midwifery and Nursing, Shahed University, Iran

[3]Assistant Professor, Faculty of Midwifery and Nursing, Shahed University, Iran

*Corresponding author: *Hossein Asgar Pour, BSc, RN, MSN, Ph.D, Assistant Professor, Department of Surgical Nursing, Aydin School of Health , Adnan Menderes University, Turkey, Tel: +90 256 213 88 66, Fax: +90 256 212 42 19, E-mail:* hasgarpour23@yahoo.com

Abstract

Acute coronary syndromes (ACS) are the leading cause of death in older adults. Early recognition of symptoms suggestive of ACS by the emergency triage nurse can improve patient outcomes. The aim of this study was to determine risk factors associated with typical and atypical symptoms in older and younger patients with ACS. This prospective study was performed on 446 patients who admitted at the Emergency Department of Tehran Medical Affiliated Hospital. Patients were considered for participation if they had undergone treatment with diagnoses of ACS based on confirmed electrocardiography changes, cardiac enzyme (CPK-MB), and had ≥ 1 of a set of typical symptoms of ACS. Patients with a history of cerebrovascular accident, heart failure, congestive occlusive pulmonary diseases, pneumonia and pulmonary embolism are excluded. Patients distributed in older (≥ 65 years) and younger (< 65 years) groups. Older patients had a statistically significant difference in typical symptoms such as chest pain, arm pain, jaw/neck pain and dyspnea compare to younger patients (P < 0.05). Older patients had no significant difference in atypical symptoms compared to younger patients (P > 0.05). Older or younger patients with a history of hypertension (OR 0.43, CI 0.25 - 0.73, P = 0.002,), smoking (OR 0.51, CI 0.30 - 0.89, P = 0.019) and obesity (OR 0.69, CI 0.51 - 0.10, P = 0.011) have less chance to experience typical symptoms of ACS. Understanding the typical symptoms of ACS and factors related that may help in the early detection and more appropriate medical treatments in patients with ACS.

Keywords

Acute coronary syndrome, Typical Symptoms, Atypical symptoms, Elderly

Introduction

Acute coronary syndrome (ACS) is health-threatening and a major cause of mortality in elderly [1-4]. ACS encompasses a spectrum of coronary artery diseases (CAD), including unstable angina, ST-elevation myocardial infarction and non-ST elevation myocardial infarction with initial presentation and early management [5]. Diagnosis of ACS in older patients is difficult and it related to natural and pathological changes associated with elderly [6]. Wall thickening and dilatation are prominent structural changes that occur within large elastic arteries during aging. Age-associated changes in arterial properties of individuals who are otherwise considered healthy may have relevance to the exponential increase in ACS [7]. Increased age has been identified as an important risk factor for adverse events and complications of ACS and treatment. Complication and mortality rate related to ACS have increased with age [8]. Sixty percent of all deaths due to acute myocardial infarction are reported in older patients and mortality is about three times more than younger patients [9]. The results of Gillis et al. (2013) study showed that older adults with ACS have higher in-hospital mortality rates than adults aged younger than 65 years.

ACS is characterized by typical and atypical symptoms. Typical symptoms include chest pain, arm pain, shortness of breath, sweating and jaw/neck pain. Atypical symptoms include fainting, weakness, palpitation, nausea/vomiting, mid-back pain, numbness/tingling in the chest, loss of consciousness and gastrointestinal complaints. Patients with ACS mostly present typical chest pain. Atypical symptoms are seen more among older patients [10]. Absence of the typical symptoms is the most important factor for not using thrombolytic therapy and increased hospital mortality [11]. Delay in time in arrival to the hospital, as well as delay to primary percutaneous intervention, is reported for older adults with and without typical symptoms. 2 Identifying the symptoms of ACS is important for successful management. Furthermore, understanding the factors related to symptoms may help in the early detection and appropriate medical treatments [11-13]. Many studies have described the association of risk factor such as hypertension, dyslipidemia and smoking with ACS [12-16]. But there are limits researches about association of risk factors of typical and atypical symptoms of ACS in older or younger patients [12,17]. The aim of this study was to determine risk factors associated with typical and atypical symptoms in older and younger patients with ACS.

Method

This prospective study was conducted between March 2011, and June 2012 at the Emergency Department (ED) of a medical affiliated

ClinMed International Library

hospital. Patients were eligible for inclusion if they had undergone treatment with diagnoses of ACS (STEMI, NSTEMI or unstable angina) based on confirmed electrocardiography changes, cardiac enzymes (CPK-MB), and patients who had ≥ 1 of a set of typical symptoms of ACS. Typical symptoms of ACS were chest symptoms (pain below the sternum or on the left chest), arm pain, diaphoresis, jaw/neck pain and dyspnea. Atypical symptoms were fatigue/weakness, palpitation, nausea/vomiting, mid-back pain, chest pain in another location (numbness, tingling, pricking, or stabbing in chest), and indigestion. Samples of study distributed in older (≥ 65 years) and younger group (< 65 years). Patients with a history of cerebrovascular accident, heart failure, congestive occlusive pulmonary diseases, pneumonia and pulmonary embolism are excluded. According to the results of a pilot study with p = 0,3 and d = 0,04, a selection of 530 patients were sufficient for the sample. Of these, 446 patients agreed to participate and enrolled in this study.

Data collecting instrument was developed based on a review of literature and from the specialist's comments. Specialists included one ED physician, one ED nurse specialist, two ED staff nurses, one cardiologist, and a cardiac clinical nurse specialist. Check list consists of symptoms which divided to two typical and atypical symptoms categories. The authors categorized all extracted symptoms to typical and atypical symptoms based on Milner Classification [18]. Data collecting was conducted during shifts of 6 hours across all 24 hours and all 7 days, and 8 nurse data collectors observed all the patients who met the study criteria as they admitted to the ED. ACS was defined as either unstable angina or acute myocardial infarction, confirmed by electrocardiography changes (ST-segment and T-wave changes) and cardiac enzyme (CPK-MB). For more unified data collection, investigator interviewed and trained nurses before beginning the study and practices on number of patients for confidence of accurate procedure. Data on presenting symptoms were obtained by observing the patient-nurse interview, and related symptoms of ACS expressed by the patient were documented in ACS symptoms check list. Demographics variables such as sex, age and risk factors such as history of hypertension, hypercholesterolemia, diabetes,

currently smoking and obesity were collected from the medical records. Obesity is considered as BMI ≥ 30.

The study was approved by the Institutional Ethics Committee of the Shahed University in Tehran. Written approvals were obtained from the Shahed University Institute of Health Sciences (March, 2010), Ethics Board of the Shahed University Midwifery and Nursing Faculty (May, 2010), Tehran Medical Affiliated Hospital (June, 2010). Written and verbal informed consent was obtained from all patients after explaining the aims and protocol of the study.

The data analysis was performed by using SPSS version 16.0 (Statistics for Social Sciences) for windows statistics program. To examine the associations between ACS and baseline characteristics and also typical/atypical symptoms in younger and older patients, chi-squared test were used. Symptoms that reported by at least 5% were included in the bivariate analyses. To determine risk factors related to typical and atypical symptoms of ACS between older and younger the method of multiple logistic regressions with stepwise was performed. Adjusted Odd ratios were estimated for each risk factor. Statistical significance was set at p < 0.05.

Results

Among the 446 patients 66.6% (n = 297) of them were in the older and 33.4% (n = 149) in the younger group. The mean age of patients was 67.13 ± 8.79 years. The mean age of older patients was 71.32 ± 3.81 yr and younger patients were 53.57 ± 8.07. Results showed a significant difference in risk factors such as smoking (P = 0.002), obesity (P = 0.019) and hypertension (P = 0.002) between younger and older patients. The results did show a significant difference in type of ACS by age groups (P < 0.01) (Table 1).

The most typical symptom in older patients was dyspnea (36.7%) and the lowest was jaw/neck pain (6.74%). The most atypical symptom in older patients was palpitation (38.89%) and the lowest were indigestion (3.47%) and chest pain in another location (3.47%), respectively. The chi-square test showed that younger and older patients have statistically significant difference in typical symptoms such as chest symptoms (P = 0.027), arm pain (P = 0.033), jaw/ neck pain (P = 0.001) and dyspnea (P = 0.048). However, there were no significant differences between atypical symptoms between older and younger (P > 0.05) (Table 2).

In multivariate logistic regression analysis, hypertension, smoking and obesity had significant contribution (P < 0.05) in the typical symptoms of ACS between older and younger patients. Older and younger patients with a history of hypertension (OR 0.43, 95% CI 0.25 - 0.73, P = 0.002), smoking (OR 0.51, 95% CI 0.30-0.89, P = 0.019), and obesity (OR 0.69, 95% CI 0.51-0.10, P = 0.011) have less chance to experience typical symptoms of ACS (Table 3).

Discussion

ACS is a major cause of mortality in elderly [2,5,6]. Identifying the symptoms of ACS and factors related to these symptoms are important for successful management and may help in the early detection and appropriate medical treatments [11-13]. Age is

Table 1: Characteristics of Older and Younger Patients with ACS

Variables		Older(n=297)	(n=149) Younger	p
		n(%)	n(%)	
AGE	Mean ± SD (yr)	71.32 ± 3.81	53.75 ± 8.07	< 0.001
Gender	Male	188(63.3)	83(55.7)	0.130
	Female	109(36.7)	66(44.3)	
Risk factors	Smoking	52(32.5)	103(36.8)	0.002
	Hypercholesterolemia	116(43.8)	67(45)	0.837
	Obesity	164(61.7)	112(73.2)	0.019
	Diabetes	47(30.1)	70(28.3)	0.741
	Hypertension	107(39.1)	85(54.5)	0.002
ACS type	STEMI	195(43.7)	43(9.6)	
	NSTMI	62(13.9)	84(18.8)	< 0.01
	Unstable angina	40(8.9)	22(4.9)	

Table 2: Typical and Atypical Symptoms of ACS in Older and Younger Patients

		Older (n = 297)	Younger (n = 149)	
Typical and Atypical Symptoms		n(%)	n(%)	P
Typical Symptoms	Chest pain	63(21.21)	46(30.87)	0.027
	Arm pain	51(17.17)	36(24.16)	0.033
	Diaphoresis	54(18.18)	37(24.83)	0.620
	Jaw/ Neck pain	20(6.74)	16(10.73)	0.001
	Dyspnea	109(36.70)	14(9.40)	0.048
Atypical Symptoms	Fatigue/ Weakness	40(27.78)	65(27.08)	0.481
	Palpitation	56(38.89)	89(37.08)	0.463
	Nausea/vomiting	28(19.45)	37(15.43)	0.916
	Mid-back pain (between shoulder blades)	10(6.94)	24(10)	0.529
	Chest pain (other location, not in left side)	5(3.47)	23(9.58)	0.480
	Indigestion	5(3.47)	2(0.83)	0.534

• Page 2 of 4 •

Table 3: Factors Related to Typical Symptoms of ACS in Older and Younger Patients

Variables	Older (n = 297)	Younger (n = 149)	
	OR (95% CI)	OR (95%CI)	P
Diabetes	1.40 (0.81 - 2.43)	0.72 (0.43 - 1.19)	**0.227**
Hypertension	0.43 (0.25 - 0.73)	2.10 (1.32 - 3.36)	**0.002**
Hypercholesterolemia	1.02 (0.62 - 1.71)	0.91 (0.57 - 1.44)	**0.927**
Smoking	0.51 (0.30 - 0.89)	(3.44-1.13) 1.97	**0.019**
Obesity	0.69 (0.51 - 0.10)	1.44 (1.06 - 1.95)	**0.011**

an important determinant of outcomes for patients with ACS [14]. Symptoms, which are a key component in the patient's decision to seek care, are critical to appropriate triage, and influence the decision on whether to pursue further evaluation and initiation of treatment [9,15]. The primary complaint of the patients with ACS is characterized predominantly by chest pain. However, a substantial number of patients may have atypical or no symptoms on initial evaluation. Atypical symptom indicates that the patient's chief complaint is not chest pain, but other gastrointestinal or respiratory symptoms with less intense chest pain [12,18].

Our study results showed a significant difference in the typical symptoms of ACS between older and younger patients. Dominant typical symptom in older patients was dyspnea. Also, the results of some studies showed that a higher prevalence of dyspnea in older patients [19-24].

This study showed that chest pain is more likely in younger than older patients. Also, in some investigations chest pain was more likely in younger patients [15,24]. Similarly, studies showed that chest pain significantly reduced in older patients, but, some studies suggested atypical symptoms such as dizziness/syncope, indigestion, and weakness is more frequent in older patients [11,13,20,21,23,25-27]. Similar to this study, Milner et al. did not find a significant difference about atypical symptoms between older and younger patients with ACS [18]. Gillis et al. study showed that older adults reporting an absence of chest pain on arrival are twice as likely to die compared with older adults with chest pain2. According atypical symptoms, our study results showed no significant difference in atypical symptoms between older and younger patients, but a dominant atypical symptom in the both patients groups was palpitation.

At the present study, patients with typical symptoms such as chest pain, arm pain, jaw/neck pain, dyspnea were more likely to be hypertensive, obese and smokers. Also, diabetes and hypercholesterolemia were not predictors of typical symptoms in older or younger patients. Hwang showed that diabetes is not a predictor in the whole patient group with atypical symptom [22]. In Langer study, diabetic patients have impaired perception of symptoms such as chest pain [28]. Hasin showed patients with diabetes have a less typical presentation [29]. In this research, in contrast of Hwang study (2009) there was a correlation between female gender and early symptoms. It is assumed, beside to physiological and pathological changes related to aging, older women are likely more affected by chronic condition or risk factors. Canto has found that smoking and hypercholesterolemia were associated with chest pain [30]. Also, this study findings showed the effect of smoking on typical symptoms of ACS. However, this effect is not observed for hypercholesterolemia. Pinto reported that in elderly atypical symptoms is about four times less likely in the presence of hypertension, dyslipidemia and smoking [31]. This study findings suggest that older or younger patients with ACS have less typical symptoms in the presence of hypertension, smoking and obsity.

The results of this study showed the effects of some risk factors on how to report typical symptoms of ACS. Initial assessment and risk classification probably will challenged in being of some risk factors such as obesity, hypertension and smoking. It is recommended to investigate the interactive effects of multiple risk factors on reporting symptoms of ACS.

Study Limitation

In this study several emerging risk factors such as lipoprotein abnormalities, hypercoagable states, elevated homocysteine levels, markers of inflammation and platelet glycoprotein were not evaluated. Furthermore, subgroup analysis about symptoms of older or younger patient groups with STEMI, NSTEMI and unstable angina were not evaluated.

Implications for Practice

- Diagnosis of ACS in older patients is difficult due to natural and pathological changes associated with elderly. Identifying the symptoms of ACS is important for successful and immediate treatment.

- Chronic diseases and age-specific physiological and pathological features can affect the presentation of symptoms of ACS in the elderly. Understanding the factors related to symptoms may help in the early detection and more appropriate medical treatments of the patients with acute coronary syndrome.

- Symptoms of ACS is affected by risk factors. Older and younger patients with a history of risk factor such as obesity, hypertension and smoking have less chance to experience the typical symptoms.

- One of the important tasks of clinical treatment and care providers is obtaining an accurate history of the patient with cardiac complaints. Identifying the symptoms of ACS is important for successful and immediate treatment.

- To findings suggest very carefully examining in the history taking from patients suspected of cardiac ischemic problems at emergency departments.

Conclusion

The results of this study showed that the typical symptoms such as chest pain, arm pain, jaw/neck pain and dyspnea were more predictive of ACS in older than younger patients. Identifying the symptoms of ACS is important for successful and immediate treatment. Accurate diagnosis of ACS could reduce hospital mortality and morbidity. In this study, it seems typical symptoms of ACS in older or younger patients are affected by risk factors such as obesity, hypertension and smoking. Clinical treatment and care providers need to very carefully examine any patients suspected of ACS with a history of risk factors.

Author contribution

HA, RN and and MRH were responsible for the study conception and design and drafting of the manuscript.

Conflict of interest

None of the authors has any potential conflicting interest in this study.

References

1. Dessotte CA, Dantas RA, Schmidt A, Rossi LA (2011) Health-related quality of life in patients admitted after a first episode of acute coronary syndrome. Rev Lat Am Enfermagem 19: 1106-1113.

2. Gillis NK, Arslanian-Engoren C, Struble LM (2014) Acute coronary syndromes in older adults: a review of literature. J Emerg Nurs 40: 270-275.

3. McCaig LF, Nawar EW (2006) National Hospital Ambulatory Medical Care Survey: 2004 emergency department summary. Adv Data : 1-29.

4. Thygesen K, Alpert JS, White HD; Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction, Jaffe AS, Apple FS, et al. (2007) Universal definition of myocardial infarction. Circulation 116: 2634-2653.

5. Achar SA, Kundu S, Norcross WA (2005) Diagnosis of acute coronary syndrome. Am Fam Physician 72: 119-126.

6. Biranvand M, Kolahi A, Ghafelehbashi HR (2008) Characteristics and terminal diagnosis of ACS patients. Babol Medical University Journal 10: 76-82.

Pour et al. Int J Clin Cardiol 2015, 2:6

ISSN: 2378-2951 • Page 3 of 4 •

7. Wilbert S, Aronow LF (2005) Cardiovascular Disease in The Elderly, 3rd Edition, Taylor and Francis e-Library.

8. Rittger H, Hochadel M, Behrens S, Hauptmann KE, Zahn R, et al. (2012) Age-related differences in diagnosis, treatment and outcome of acute coronary syndromes: results from the German ALKK registry. EuroIntervention 7: 1197-1205.

9. Biranvand M, Asadpourpiranfar M (2006) Dislypedimia at acute coronary syndrome. Pajouhandeh 6: 377-384.

10. Bayer AJ, Chadha JS, Farag RR, Pathy MS (1986) Changing presentation of myocardial infarction with increasing old age. J Am Geriatr Soc 34: 263-266.

11. Calle P, Jordaens L, De Buyzere M, Rubbens L, Lambrecht B, et al. (1994) Age-related differences in presentation, treatment and outcome of acute myocardial infarction. Cardiology 85: 111-120.

12. Nobahar M, Vafaee A (2005) Comparison of acute coronary syndrome in young and old patients. Qazvin Medical University Journal 9: 18-22.

13. Paul SD, O'Gara PT, Mahjoub Z, A DiSalvo TG, O'Donnell CJ, et al. (1996) Geriatric patients with acute myocardial infarction. Cardiac factor profiles, presentation, thrombolysis, coronary interventions, and prognosis. Am Heart J 131: 710-715.

14. Alexander KP, Newby LK, Cannon CP, Armstrong PW, Gibler WB, et al. (2007) Acute coronary care in the elderly, part I: Non-ST-segment-elevation acute coronary syndromes: a scientific statement for healthcare professionals from the American Heart Association Council on Clinical Cardiology: in collaboration with the Society of Geriatric Cardiology. Circulation 115: 2549-2569.

15. Han JH, Lindsell CJ, Hornung RW, Lewis T, Storrow AB, et al. (2007) The elder patient with suspected acute coronary syndromes in the emergency department. Acad Emerg Med 14: 732-739.

16. Sheifer SE, Gersh BJ, Yanez ND 3rd, Ades PA, Burke GL, et al. (2000) Prevalence, predisposing factors, and prognosis of clinically unrecognized myocardial infarction in the elderly. J Am Coll Cardiol 35: 119-126.

17. Tresch DD (1998) Management of the older patient with acute myocardial infarction: difference in clinical presentations between older and younger patients. J Am Geriatr Soc 46: 1157-1162.

18. Milner KA, Funk M, Richards S, Vaccarino V, Krumholz HM (2001) Symptom predictors of acute coronary syndromes in younger and older patients. Nurs Res 50: 233-241.

19. Brieger D, Eagle KA, Goodman S, Steg PG, Budaj A, et al. (2004) Acute coronary syndrome without chest pain, an under diagnosed and undertreated high-risk group: insights from the global registry of acute coronary events. Chest 126: 461-469.

20. Corsini F, Scaglione A, Iacomino M, Mascia G, Melorio S, et al. (2006) Acute myocardial infarction in the elderly. A case-control study with a younger population and review of literature. Monaldi Arch Chest Dis 66: 13-19.

21. Gregoratos G (2001) Clinical manifestations of acute myocardial infarction in older patients. Am J Geriatr Cardiol 10: 345-347.

22. Hwang SY, Park EH, Shin ES, Jeong MH (2009) Comparison of factors associated with atypical symptoms in younger and older patients with acute coronary syndromes. J Korean Med Sci 24: 789-794.

23. Ryan CJ, DeVon HA, Horne R, King KB, Milner K, et al. (2007) Symptom clusters in acute myocardial infarction: a secondary data analysis. Nurs Res 56: 72-81.

24. Woon VC, Lim KH (2003) Acute myocardial infarction in the elderly--the differences compared with the young. Singapore Med J 44: 414-418.

25. Angerud KH, Brulin C, Näslund U, Eliasson M (2012) Patients with diabetes are not more likely to have atypical symptoms when seeking care of a first myocardial infarction. An analysis of 4028 patients in the Northern Sweden MONICA Study. Diabet Med 29: e82-87.

26. Joly L, Bénétos A (2006) [Clinical specificities of coronary artery disease in the elderly]. Arch Mal Coeur Vaiss 99 Spec No 4: 29-33.

27. Solomon CG, Lee TH, Cook EF, Weisberg MC, Brand DA, et al. (1989) Comparison of clinical presentation of acute myocardial presentation of acute myocardial infarction in patients elder than 65 years of age to younger patients: the multi center chest pain study experience. Am J Cardiol 63: 772-776.

28. Langer A, Freeman MR, Josse RG, Steiner G, Armstrong PW (1991) Detection of silent myocardial ischemia in diabetes mellitus. Am J Cardiol 67: 1073-1078.

29. Hasin T, Hochadel M, Gitt AK, Behar S, Bueno H, et al. (2009) Comparison of treatment and outcome of acute coronary syndrome in patients with versus patients without diabetes mellitus. Am J Cardiol 103: 772-778.

30. Canto JG, Shlipak MG, Rogers WJ, Malmgren JA, Frederick PD, et al. (2000) Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. JAMA 283: 3223-3229.

31. Pinto D, Lunet N, Azevedo A (2011) Prevalence and determinants of atypical presentation of acute coronary syndrome. Acta Med Port 24: 307-318.

Pour et al. Int J Clin Cardiol 2015, 2:6

ISSN: 2378-2951 • Page 4 of 4 •